

CLAIMS

What is Claimed is:

1. A method of making a recyclable energetic composition for low temperature storage
2 comprising:
3 mixing at least one binder compound having at least one pendant azido group
4 component with at least one plasticizer component;
5 heating said binder(s) and said plasticizer(s) mixture until the mixture is
6 homogeneous;
7 cooling said mixture to room temperature;
8 adding at least one diacetylene component to said mixture without the aid of a
9 solvent to produce longer polymer chains on said binder(s);
10 adding at least one metal, metallic, non-metal fuel, oxidizer component(s) to
11 said mixture at room temperature; and
12 adding at least one tri- or higher polyacetylene component without the aid of a
13 solvent to produce a homogeneous solid, elastomeric composition which is formed by
14 chemically reacting said azido groups of said polymer binder(s) by cyclo-addition of
15 said triacetylene component(s) to form triazole linkages.
- 1 2. The method according to claim 1, further comprising adding at least one stabilizer
2 component to said mixture and while heating said mixture.
- 1 3. The method according to claim 1, further comprising at least one stabilizer
2 component dissolved in a volatile solvent, combining said stabilizer to said

3 plasticizer first before combining with said binder to prevent any decomposition of
4 said plasticizer.

1 4. The method according to claim 1, wherein said diacetylene and said tri- or higher
2 polyacetylene component are combined to the mixture while being heated.

1 5. The method according to claim 1, wherein said heating of said binder(s) and said
2 plasticizer(s) mixture ranges from temperatures of about 100°F to about 130°F.

1 6. The method according to claim 1, further comprising adding other components to
2 said energetic composition selected from the group comprising burn rate catalysts
3 and modifiers, thermal, combustion and aging stabilizers, and opacifiers.

1 7. The method according to claim 1, wherein other solid propellant ingredients are
2 added to the binder/plasticizer components including said oxidizer.

1 8. The energetic low temperature storage composition obtained by the process defined
2 in claim 1.